CHAPTER 5. BIOLOGICAL RESOURCES MANAGEMENT

5.1 Wetlands Management

Wetlands are an integral part of healthy ecosystems, providing several important functions including moderating extremes in water flow, aiding natural purification of water, and maintaining and recharging groundwater. Wetlands are nursery areas for many terrestrial and aquatic animal species. In addition to their important ecological functions, wetlands are high in aesthetic value and support a variety of recreational activities such as fishing, hunting, and bird watching.

Wetlands are periodically or permanently inundated by surface water and are characterized by saturated soils and vegetation adapted for life in saturated soils (USACE 1985; Executive Order [EO] 11990).

ERF is a 2,165 acre estuarine salt marsh.

5.1.1 Wetlands Management Program Goals

Wetlands management goals all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. The wetlands management goals for Fort Richardson are:

- Implement an effective wetland management plan that will maintain and enhance the health, productivity, and biological diversity of wetland ecosystems.
- Attain goals by applying management prescriptions listed in the wetlands management action plan.
- Ensure that USARAK is in compliance with all applicable federal and state laws and regulations regarding wetlands.
- Provide wetland areas for realistic military training while maintaining ecosystem integrity and minimizing impacts to wetlands.
- Distribute wetland management prescriptions to all Fort Richardson user groups: military, recreationalists, Directorate of Public Works, and Alaska Fire Service.
- Promote early coordination between installation staff and the Environmental Resources Department (ERD) to prevent adverse impacts to wetlands.
- Provide a customer-friendly process to initiate wetland permits for military exercises or construction.

Wetlands management on Fort Richardson is implemented on the belief that effective military training can be accomplished with minimal long-term environmental damage, while also complying with applicable laws and regulations. Effective training and environmental stewardship are compatible and necessary for the maintenance of a quality military training environment and protection of sensitive wetland areas.

5.1.2 Wetlands Management Plan

Wetlands program management and planning includes all the planning, budgeting, contract oversight, and organization necessary to implement the wetlands management program. The primary emphasis for this component of the wetlands management program is to prepare and update a wetlands management plan for Fort Richardson.

Description and Justification: Prepare, update, and implement a wetlands management action plan for Fort Richardson. Due to the importance and extent of wetlands found on Fort Richardson, a wetlands management plan is necessary to give direction and establish policy for the use, maintenance, and restoration of wetlands. This document supports the military mission and works in conjunction with the Fort Richardson Integrated Natural Resources Management Plan (INRMP). Implementation of an effective wetland management action plan would maintain the health, productivity, and biological diversity of wetland ecosystems. Updates of the wetlands management action plan are required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, update, and maintain a wetlands management action plan.
- Effectively protect sensitive wetlands, while allowing military use in low-function wetlands.

Cleanup strategies employed on ERF included dredging, draining, and capping contaminated areas.

- Involve the resource agencies in the wetlands management planning process, and the public in review of the plan.

Management History: The first wetlands management action plan was completed in 2001.

Current Management: Current management actions to update the wetlands management plan will cease in 2002. If this INRMP is not approved and funded, no new wetlands management plan will be prepared, updated, or implemented. Policies already in place in the current wetlands management plan will continue.

Proposed Management: Prepare and update the wetlands management action plan for Fort Richardson as outlined in Table 5-1.

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current wetlands management action plan with scheduled updates at least every five years. NEPA documentation is also legally mandated.

5.1.3 Wetlands Inventory and Monitoring

5.1.3.1 Wetlands Monitoring

Wetlands monitoring concentrates on wetlands areas that have been used for maneuver training. Approximately 50,000 acres of Fort Richardson are available for maneuver use. This use includes general field training exercises such as military maneuvers, bivouac (camping) activities, and live fire operations from permanent firing ranges. Military training typically involves the movement of tracked or wheeled vehicles across road-less terrain. Foot traffic is also classified as a training activity. Almost all military training tasks involve a maneuver component, and can take place both on and off-road. The goal of wetlands monitoring at Fort Richardson is to quantify the extent and severity of disturbance to wetlands from both military and civilian land use.

Description and Justification: The Alaska Region Land Condition Trend Analysis (AKLCTA) program is utilized to monitor military and nonmilitary use of wetlands at Fort Richardson (see Section 4.1.3). LCTA is a component of the Integrated

Table 5-1. Wetlands Management Action Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Prepare annual updates of the wetlands management action plan.	USARAK Natural Resources	High	x	x	x	x	x
Prepare and update wetlands management action plan for the planning period of 2007-2011.	USARAK Natural Resources	High					x
Complete NEPA documentation for update.	USARAK Natural Resources	High					x

Training Area Management (ITAM) program. Through AKLCTA, land condition information is collected on Fort Richardson training lands, including wetlands. Among other variables, surveyors look for the type of use and any physical damage to the landscape. Conducting wetlands monitoring is required by Public Law 86-797 (Sikes Act) to implement the INRMP.

Measures of Effectiveness:

- ➤ Identify severity and quantify extent of wetlands disturbance from military and nonmilitary sources.

Management History: LCTA has been monitoring disturbance in wetlands since 1997. Aerial surveys for wetlands disturbance have been conducted since the 1970s.

Current Management: Use of wetlands on Fort Richardson is monitored through the existing AKLCTA program. In addition to quantitative monitoring through AKLCTA, ERD staff continues to conduct qualitative assessments of use during large military training field exercises. This effort prevents undue wetlands damage and ensures quick and proper wetland reclamation, where necessary. Recreational use of wetlands is also monitored through the LCTA program and through observation by the ERD staff.

Proposed Management: Apply for a general wetlands permit for military training at Fort Richardson from the U.S. Army Corps of Engineers, so as to avoid the necessity of acquiring individual permits for specific training events. Continue the monitoring of wetlands use on Fort Richardson as outlined in Table 5-2.

Other Management Alternatives Considered and Eliminated: There are other potential methods of monitoring wetlands. The Alaska Region LCTA methods, however, were developed specifically for vegetation and military disturbance monitoring in Alaskan ecosystems and serve well to assess disturbance in wetlands.

5.1.3.2 Planning-Level Wetlands Inventory

Description and Justification: Conduct a planning-level wetlands inventory of Fort Richardson. The wetlands inventory includes a wetlands classification, a description of the functions and values of wetlands on Fort Richardson, and management recommendations. The National Wetlands Inventory failed to detect many of the smaller wetlands on Fort Richardson, which rendered it inadequate for installation natural resources management pro-

Table 5-2. Wetlands Monitoring.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Use AKLCTA methodology to monitor military use of wetlands.	USARAK Natural Resources	High	x	x	x	x	x
Continue to monitor large military training field exercises.	USARAK Natural Resources	High	x	x	x	x	x
Use AKLCTA methodology to monitor nonmilitary use of wetlands.	USARAK Natural Resources	High	x	x	x	x	x

grams. A wetlands inventory on Fort Richardson is required for management of withdrawn public lands. An accurate planning-level wetlands survey is required by AR 200-3 and is required to implement this INRMP as mandated by Public Law 86-797 (Sikes Act). Per Memorandum DAIM-ED-N, 21 March 1997, this planning-level survey is a class 1 requirement.

Measures of Effectiveness:

- ➤ Complete, maintain, and update the planning-level wetlands survey for Fort Richardson.
- ➤ Identify the requirement for a planning-level wetlands survey in the EPR.

Management History: WES completed a wetlands inventory in 1996 (Lichvar and Specher 1996). This inventory, combined with a functions and values analysis (also done by WES), was used to prepare the first wetlands management action plan in 2001.

Current Management: Two wetland inventories have been completed on Fort Richardson: the National Wetlands Inventory (NWI) by the USFWS and the Waterways Experiment Station (WES) inventory by the U.S. Army Corps of Engineers (USACE). When making management decisions concerning wetlands, both inventories are utilized. In instances where a CWA Section 404 Individual or Nationwide Wetland Permit is required, the ERD staff will utilize both inventories prior to making initial site visits. If the proposed project area is within a wetland area, as confirmed by the inventories and a site visit, ERD staff will request a Jurisdictional Determination by USACE. Ultimately, USACE will conduct a site visit and complete a wetland delineation for the project area. USACE will recommend the type of wetland permit application to submit.

Proposed Management: Update the planning-level wetlands inventory for Fort Richardson as outlined in Table 5-3.

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current planning-level wetlands inventory. Per the Sikes Act, AR 200-3, and Memorandum DAIM-ED-N, 21 March 1997, this planning-level inventory must be updated every 10 years.

5.1.4 Wetlands Management

Fort Richardson's wetlands have been identified and delineated.

Description and Justification: Wetlands management entails managing military, recreational, and other use to minimize disturbance. Wetlands management also includes restoration of disturbed

Table 5-3. Planning-Level Wetlands Inventory.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Update the planning-level wetlands survey.	USARAK Natural Resources	High					x

areas. Wetlands management will help maintain proper wetland functions while allowing military training and will ensure that plant, wildlife, and soil resources are not degraded. Implementation of wetlands management will improve the quality of military training at Fort Richardson by providing realistic training options in wetlands, resulting in an overall increase in training opportunities. In addition, conducting wetlands management activities will reduce the amount of planning time previously needed for wetland permit applications to train in wetlands. Wetlands management also establishes a basis for conservation and protection of wetlands. Conducting wetlands management is required by Public Law 86-797 (Sikes Act) to implement the INRMP.

Measures of Effectiveness:

- ➤ No net loss of wetlands during 2002-2006.
- ➤ No restriction in the amount of military training during 2002-2006.
- ➤ No Notices of Violation (NOV) from use of wetlands in 2002-2006.
- ➤ Minimize restrictions to training from wetlands management policies and issues.
- ➤ Coordinate with the USACE for all proposed actions that have the potential to impact wetlands.
- ➤ All mitigation measures identified in CWA Section 404 permits for natural resource management projects/plans are being implemented per the agreed schedule.

Wetlands Management Areas: The environmental limitations overlay system was developed as a tool for planning military training activities and managing wetlands. Map polygons depicting approved and restricted activities in wetland areas are listed in three color-coded categories that can be overlayed on existing maps of Fort Richardson. The environmental limitations overlay is available at each Range Control or in each ITAM office. ITAM or Range staff provide instruction on use of the overlay. Each overlay is available in a summer and winter version. The three categories on the overlays are described in Tables 5-4 and 5-5 and in the paragraphs that follow these tables. The environmental limitations overlay is shown in Figure 5-1.

LRAM involve repair of damaged lands and use of land construction technology to avoid future damage.

Management History: Wetlands protection has been strengthened by the completion of a comprehensive post-wide wetlands inventory (Lichvar and Specher 1996). Further studies to include wetland functions and values will also help provide information that will be useful in wetlands protection and enhancement.

Current Management:

Wetlands Use Management: To protect certain wetland areas and to prevent damage, USARAK developed the environmental limitations overlay system (as described above). In addition to the overlay system, USARAK has implemented an Environmental Awareness (EA) program, in part to reduce damage to wetlands from maneuver or other training activities. A variety of materials and methods are used to educate the military on a wide range of environmental issues, including wetlands. For example, educational briefings on environmental issues, including wetland identification, are held throughout the year and EA materials are presented at Range Control briefings, pre-command briefings and before all major field exercises. Training Requirements Integration (TRI) is another component of the ITAM program that is implemented to minimize damage to natural resources by integrating military training requirements with natural resources concerns. In the case of wetland management, TRI has been accomplished by range scheduling procedures and the use of environmental limitations overlays.

Table 5-4. Environmental Limitations Overlay, Summer Land-Use Category Definitions.

Category	Approved Activity SUMMER	Limited Activity (requires approval by Range Control on a case-by-case basis)	Prohibited Activity
GREEN No limitations or restrictions	- Tracked, wheeled and foot maneuvers - Bivouacs - Defensive fighting positions - Digging - Earth moving - Field kitchens - Laundry and bath facilities - Water purification - Portable latrines - Slit trenches - Vehicle decontamination training - Timber cutting (under 4" in diameter) - POL distribution	- Smoke generation - Fuel farms	None
YELLOW Minor limitations or restrictions	- Tracked, wheeled and foot maneuvers - Bivouacs - Assembly areas - Defensive fighting positions - Timber cutting (under 4" in diameter)	- Digging - Earth moving	- Laundry and bath facilities - Portable latrines - Slit trenches - Vehicle decontamination training - Smoke generation - Fuel farms - POL distribution
RED Significant limitations or restrictions	- Foot maneuvers	-Tracked and wheeled maneuvers	- Bivouacs - Assembly areas - Defensive fighting positions - Timber cutting (under 4" in diameter) - Mechanical digging - Earth moving - Laundry and bath facilities - Portable latrines - Slit trenches - Vehicle decontamination training - Smoke generation - Fuel farms - POL distribution

Summer Special Conditions. The red and yellow categories on these overlays each have special conditions that must be observed while training in those areas.

Green: No environmental restrictions. However, all normal procedures outlined elsewhere in this regulation should be followed. Smoke generation and fuel farms in areas represented as green on the overlay require prior approval from Range Control on a case-by-case basis.

Yellow: Notify Range Control when planning to train in yellow areas. Environmental/ITAM staff must pre-survey area. Stream crossings are permitted at 90 degree angles only.

Red: Notify Range Control when planning to use red areas. Environmental/ITAM staff must pre-survey red area to determine on-the-ground limits of each red area. Open water and streams have 50 meter buffer – NO VEHICLES IN BUFFER – FOOT MANEUVER ONLY. Stream crossings at 90 degree angle to water flow only. No stream crossing at shear or cut banks. Vehicular maneuver is not allowed except during stream crossings, which must be crossed at a 90-degree angle to the direction of the stream flow. No stream crossing at shear or cut banks. Earth moving, mechanical digging, bivouacs, assembly areas, fighting positions, timber cutting, laundry and bath sites, portable latrines, slit trenches, vehicle decontamination, smoke generation, and any Petroleum, Oil, and Lubricant (POL) distribution are restricted in any area designated as red on the overlay.

Table 5-5. Environmental Limitations Overlay, Winter Land-Use Category Definitions.

Category	Approved Activity WINTER	Limited Activity (requires approval by Range Control on a case-by-case basis)	Prohibited Activity
GREEN No limitations or restrictions	- Tracked, wheeled and foot maneuvers - Bivouacs - Defensive fighting positions - Digging - Earth moving - Field kitchens - Laundry and bath facilities - Water purification - Portable latrines - Slit trenches - Vehicle decontamination training - Timber cutting (under 4" in diameter) - POL distribution	- Smoke generation - Fuel farms	None
YELLOW Minor limitations or restrictions	- Tracked, wheeled and foot maneuvers - Bivouacs - Assembly areas - Defensive fighting positions - Timber cutting (under 4" in diameter)	- Digging - Earth moving - Snowplowing - Stream crossings with ADF&G permit	- Laundry and bath facilities - Portable latrines - Slit trenches - Vehicle decontamination training - Smoke generation - Fuel farms - POL distribution
RED Significant limitations or restrictions	- Foot maneuvers	-Tracked and wheeled maneuvers - Stream crossings with ADF&G permit	- Bivouacs - Assembly areas - Defensive fighting positions - Timber cutting (under 4" in diameter) - Mechanical digging - Earth moving - Laundry and bath facilities - Portable latrines - Slit trenches - Vehicle decontamination training - Smoke generation - Fuel farms - POL distribution

Winter Special Conditions. The red and yellow categories on these overlays each have special conditions that must be observed while training in those areas.

Green: No environmental restrictions. However, all normal procedures outlined elsewhere in this regulation should be followed. Smoke generation and fuel farms in areas represented as green on the overlay require approval from Range Control on a case-by-case basis.

Yellow: Notify Range Control when training in yellow areas. Environmental/ITAM staff must pre-survey area. Stream crossings at 90 degree angles only. Use caution when snow plowing. Minimum of 6 inches of snow pack must remain on trails or other clearings to minimize damage to vegetation and soils. Activities limited in areas shown as yellow on the overlay include tracked and wheeled maneuvers, bivouacs, assembly areas, defensive fighting positions and timber cutting. These activities may be approved on a case-by-case basis by Range Control and ITAM if there are no seasonal wildlife restrictions.

Red: Notify Range Control when using red areas. Environmental/ITAM staff must pre-survey red area to determine on-the-ground limits of each red area. Open water and streams have 50 meter buffer – NO VEHICLES IN BUFFER – FOOT MANEUVER ONLY. Vehicular maneuver is not allowed except during stream crossings, which must be crossed at a 90-degree angle to the direction of the stream flow. No stream crossing at shear or cut banks. Earth moving, mechanical digging, bivouacs, assembly areas, fighting positions, timber cutting, laundry and bath sites, portable latrines, slit trenches, vehicle decontamination, smoke generation, and any POL distribution (fuel farms and tankers) are restricted in any area designated as red on the overlay.

Following major exercises, USARAK staff prepares an After Action Report that details any significant occurrences during the exercise and distributes it to all participating units. This report serves as an educational document for the units to consider during their next large field exercise. Issues typically addressed in the report include wetlands damage; petroleum, lubricant and oil (POL) spills; trash and debris cleanup; snowplowing; refilling and recontouring of areas used for digging, etc.

In addition to military training, outdoor recreation can impact wetlands and wetland related species (Racine et al. 1998 and Racine 1998). These issues are addressed in the outdoor recreation management and action plan. Brief discussions of specific actions are also included in the wetlands management action plan in Appendix C.

The presence of wetlands has shaped the existing development on Fort Richardson and will continue to affect future development. Wetland areas have required and will continue to require special consideration for development. Specific goals and objectives for the future development of Fort Richardson are based on considerations of the installation mission and findings of significant on-post and off-post conditions. Future land use requirements such as construction of buildings, parking areas, recreation facilities and future mission needs may require the filling-in of wetland areas to accommodate increased demands on existing land use areas.

If the proposed project area is within a wetland area, as confirmed by existing wetland inventories and a site visit, ERD staff will request a Jurisdictional Determination by USACE. Ultimately, USACE will conduct a site visit and complete a wetland delineation for the project area. USACE will recommend the type of wetland permit application to submit.

Land reparations at Malemute Drop Zone.

Wetlands Restoration: Wetland restoration projects will be coordinated through the Land Rehabilitation and Maintenance (LRAM) program, a component of ITAM (see Chapter 4, Section 4.1.4). Techniques for repairing wetlands damaged from military training include installing waterbars, recontouring areas to match surrounding area, rolling back the vegetative mat, and revegetation.

The LRAM program is also used to identify and prioritize restoration activities in areas heavily impacted by recreational use. Impacts resulting from recreational use are similar to those resulting from military activities. Thus, similar rehabilitation measures can also be applied to these areas. Current restoration of recreational sites involves the maintenance of newly developed sites and the upgrade of locations to be developed for future recreational use.

Road drainage maintenance is important for controlling sedimentation in wetland areas. Road maintenance on training lands is generally a responsibility of the Directorate of Public Works (DPW). Some maintenance work on roads and trails on Fort Richardson is done through the LRAM program.

In the case of wildfires, land rehabilitation activities begin immediately after fire suppression activities on Fort Richardson have ended.

Ongoing projects in wetlands management include those projects funded in late in 2001 but not projected to be completed until 2002. If this INRMP is not approved and funded, wetlands management projects will cease after 2002.

Proposed Management: Conduct wetlands management on Fort Richardson as outlined in Table 5-6.

Other Management Alternatives Considered and Eliminated: There are other potential methods for protecting and managing wetlands. However, total exclusion of all wetland uses is not plausible. Military training must occur in all habitats. On the oth-

Figure 5-1. Environmental Limitations.

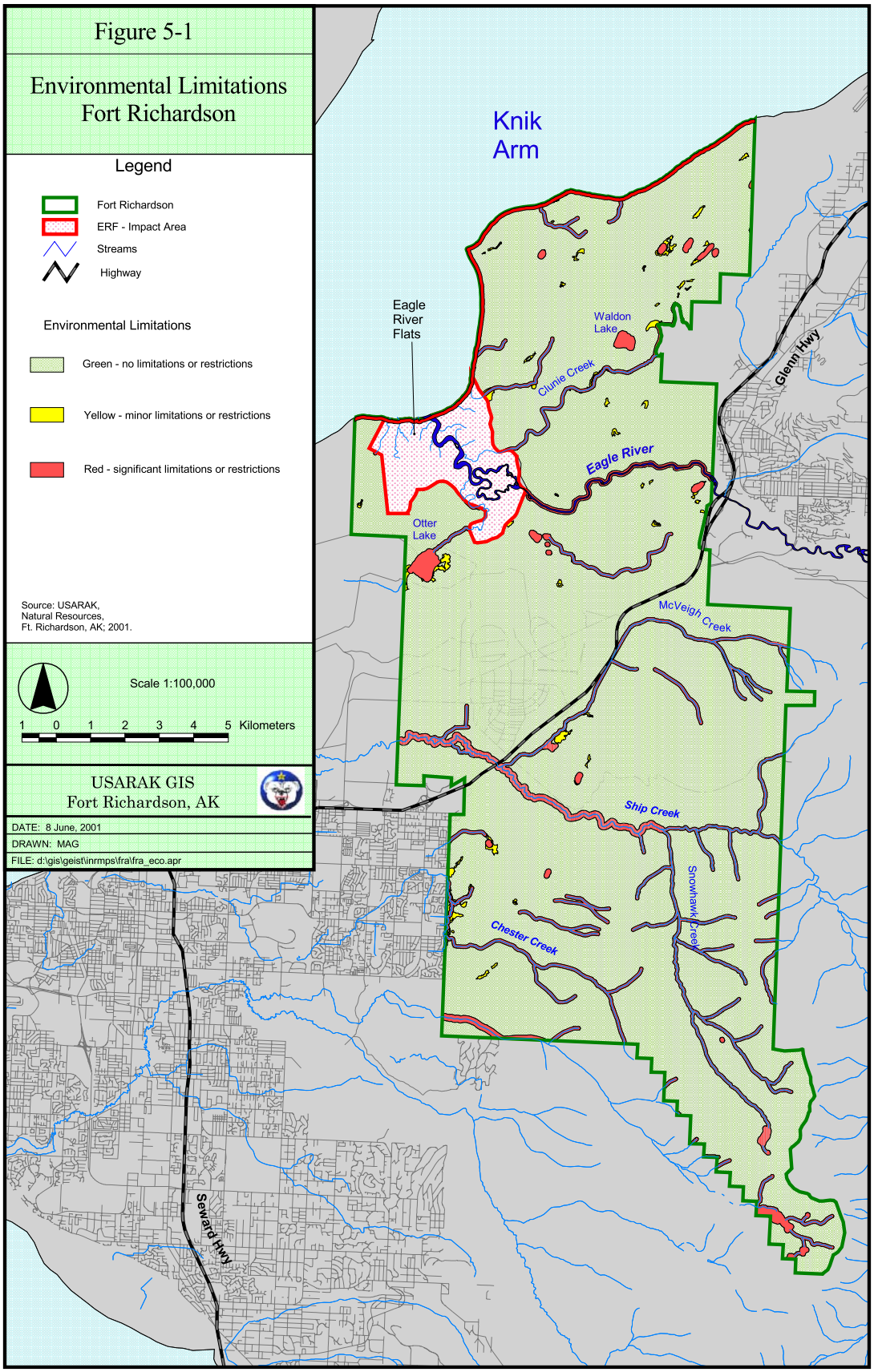


Table 5-6. Wetlands Management Projects.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Apply for a five-year individual wetlands permit to allow military training in low function wetlands.	USARAK Natural Resources	High		x			
Apply for other CWA Section 404 wetland permits on an as-needed basis.	USARAK Natural Resources	High	x	x	x	x	x
Update environmental pre-approval overlays and associated restrictions.	USARAK Natural Resources	High	x	x	x	x	x
Conduct wetlands determinations using National Wetlands Inventory (NWI) and Waterways Experiment Station (WES) Wetland Delineation.	USARAK Natural Resources	High	x	x	x	x	x
Implement AFS policy on prescribed burns in wetland areas.	USARAK Natural Resources	High	x	x	x	x	x
Conduct rehabilitation activities on damaged wetlands following military use and after fire suppression activities.	USARAK Natural Resources	High	x	x	x	x	x
Conduct rehabilitation activities on damaged wetlands occurring as a result of recreational activities and DPW activities.	USARAK Natural Resources	High	x	x	x	x	x

er hand, allowing unlimited use of wetlands could permanently damage the ecosystem. The proposed management actions listed above carefully balance the needs of the military mission, recreation, and the ecosystem. Other actions would be too minimal or would be cost prohibitive.

5.1.5 Wetlands Management Responsibilities

Range Control, a component of the Directorate of Plans, Training, Security and Mobilization (DPTSM), is the primary authority for regulating military land use and the various stipulations of Army land use permits. Range Control's authority to schedule training facilities and conduct range inspections initiates from the installation commander and is explained in the USARAK Range Regulation 350-2, which details acceptable conduct during training exercises in the field to reduce negative environmental impacts.

USACE is the authority for insuring compliance with the requirements of Section 404 of the Clean Water Act, which regulates use of wetland areas. USACE will conduct follow-up inspections of wetland areas to insure compliance with wetlands permits as issued.

5.2 Forest Management

Forest management is required to protect, maintain, and enhance the forested environments on Fort Richardson for military training. Tree density, ground cover, and forest understory are critical terrain features to challenge soldiers in military maneuvers. In addition, management of the forest ecosystem is important to maintain biodiversity, manage habitats for wildlife, and for the development of outdoor recreation opportunities.

5.2.1 Forestry Program Goals

Forestry goals all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. The forestry goals for Fort Richardson are:

- Manage vegetation and timber in support of ecosystem management objectives.
- Manage vegetation and timber in support of military range upgrade projects.
- Manage vegetation and timber to enhance recreational opportunities.

Approximately two-thirds of Fort Richardson is forested.

The steps needed to meet the forestry program goals are:

- Maintain a current inventory of forest and vegetation resources.
- Conduct forestry planning.
- Implement forest management practices through timber stand improvement, timber management, timber sales, and timber salvage cuts.
- Control forest pests.
- Provide firewood for the local military and civilian population.
- Conduct commercial timber sales only as a tool to meet the above goals.

5.2.2 Forest Management Plan

Forest management planning includes all the planning, budgeting, contract oversight, and organization necessary to implement the forestry program. The primary emphasis for this component of the forestry program is the preparation and update of the forest management action plan.

Description and Justification: Prepare, update, and implement a forest management action plan for Fort Richardson. The forest management action plan will consider public safety, preservation of habitat, and recreation. Harvests of timber products from Fort Richardson are permitted, but not mandatory. Management of the forest ecosystem is one of the most critical aspects of land management on the installation due to the high percentage of forested land and its importance to wildlife. Updates of the forest management plan are required by Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- Complete, update, and maintain a forest management action plan for Fort Richardson.
- Maintain and enhance the health and productivity of forest and woodland ecosystems.
- Maintain a diverse forest to enhance a varied military training environment.
- Involve resource agencies in the planning process for forest management and the public in review of the plan.

Management History: The first forest management action plan for Fort Richardson was completed in 2001.

Current Management: Current management actions to update the forest management action plan will cease in 2002. If this INRMP is not approved

Table 5-7. Forest Management Action Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Prepare annual updates of the forest management action plan.	USARAK Natural Resources	High	x	x	x	x	x
Prepare and update a forest management action plan for the planning period of 2007-2011.	USARAK Natural Resources	High					x
Complete NEPA documentation for update.	USARAK Natural Resources	High					x

and funded, no new forest management plan will be prepared, updated, or implemented. Policies already in place in the current forest management plan will continue.

Proposed Management: Prepare and update the forest management action plan as outlined in Table 5-7.

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current forest management action plan with updates at least every five years. NEPA documentation is also legally mandated.

5.2.3 Forest Inventory

Description and Justification: Forest inventory involves the identification of species, size class, and density of forest trees. USARAK utilizes the ecological land classification for Fort Richardson as the basis for identifying stand locations throughout the installation. Within ecological land classification units known as ecosites, stands are delineated through a combination of field surveys, air photo interpretation, and GIS. Stands are sampled to determine tree species composition, size class distribution, canopy cover, stem density, basal area, regeneration composition and density, and merchantable volumes by species. This information is essential for effective management of forest resources. Recent requests from the public indicate the need to conduct forest inventories on Fort Richardson to determine if there are sufficient resources to support a commercial forest program. The Sikes Act requires withdrawn lands, such as those at Fort Richardson, be included in INRMP planning and program implementation, including forest management. Conducting a forest inventory is required by Public Law 86-797 (Sikes Act) to implement the INRMP.

Dall sheep grazing on alpine vegetation near Site Summit.

Fort Richardson's boreal forest.

Measures of Effectiveness:

- ➤ Maintain current and accurate spatial and tabular data on the forest resources on Fort Richardson.

Management History: The only inventory of forest resources on Fort Richardson was conducted over 45 years ago, in 1955, and was not complete. As a result of a study conducted in 1995 (Marler and Vankat 1997), Fort Richardson's old growth forests have been quantitatively identified, characterized, and mapped. These forests have unique aesthetic, commercial, and ecological values. USARAK is interested in preserving these old growth forests.

Current Management: USARAK utilizes a digital vegetation map for Fort Richardson as the basis for identifying tree species locations throughout the installation. Within vegetation types, forest stands are delineated through a combination of field surveys and air photo interpretation. Stands are sampled to determine tree species composition, size class distribution, canopy cover, stem density, basal area, regeneration composition and density, and merchantable volumes by species. This information is essential for effective management of forest resources.

Continuous forest inventory plots (CFI) are also located throughout the forested areas of Fort Richardson training lands. These permanent plots are an effective method for detecting changes in forest health, composition, structure, forest fire fuel

Table 5-8. Forest Inventory.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct forest inventory on 10% of Fort Richardson lands per year that may have viable commercial forest value.	USARAK ITAM	Medium	x	x	x	x	x
Conduct continuous forest inventory plot monitoring on 100 CFI plots per year.	USARAK ITAM	Medium	x	x	x	x	x
Prepare annual forestry report.	USARAK ITAM	Medium	x	x	x	x	x

loading, and determining growth and mortality which can be applied in growth projection models. Periodic measurement of permanent sample plots is statistically superior to successive independent inventories for evaluation of changes in forest conditions. Permanent plot locations and intensity will be systematically stratified by forest type across the landscape.

Proposed Management: Conduct a forest inventory for Fort Richardson as outlined in Table 5-8.

Other Management Alternatives Considered and Eliminated: There are other potential methods of conducting a forest inventory. The proposed methods for conducting the forest inventory on Fort Richardson, however, were developed specifically for the boreal forests.

5.2.4 Forest Management

Description and Justification: Timber, fuelwood, or Christmas tree sales will be used to accomplish military and/or ecosystem management objectives. Timber stand improvement, timber management, timber sales, and timber salvage cuts may be utilized as a tool to accomplish habitat improvement or to improve the commercial value of forest tree species. A reduction in forest density in some areas is necessary to support military training and also serves as habitat management for wildlife that prefer successional stages of forest vegetation. Conducting forest management is required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS and Public Law 86-797 (Sikes Act) to implement the INRMP.

Measures of Effectiveness: Meeting military mission requirements will remain the primary objective of forest management during 2002-2006. Future management of the forest ecosystem on Fort Richardson will:

- Support the military mission.
- Enhance wildlife habitat for some species.
- Sustain production of forest products.
- Provide quality recreational opportunities.
- Minimize restrictions to training from forest management policies and issues.

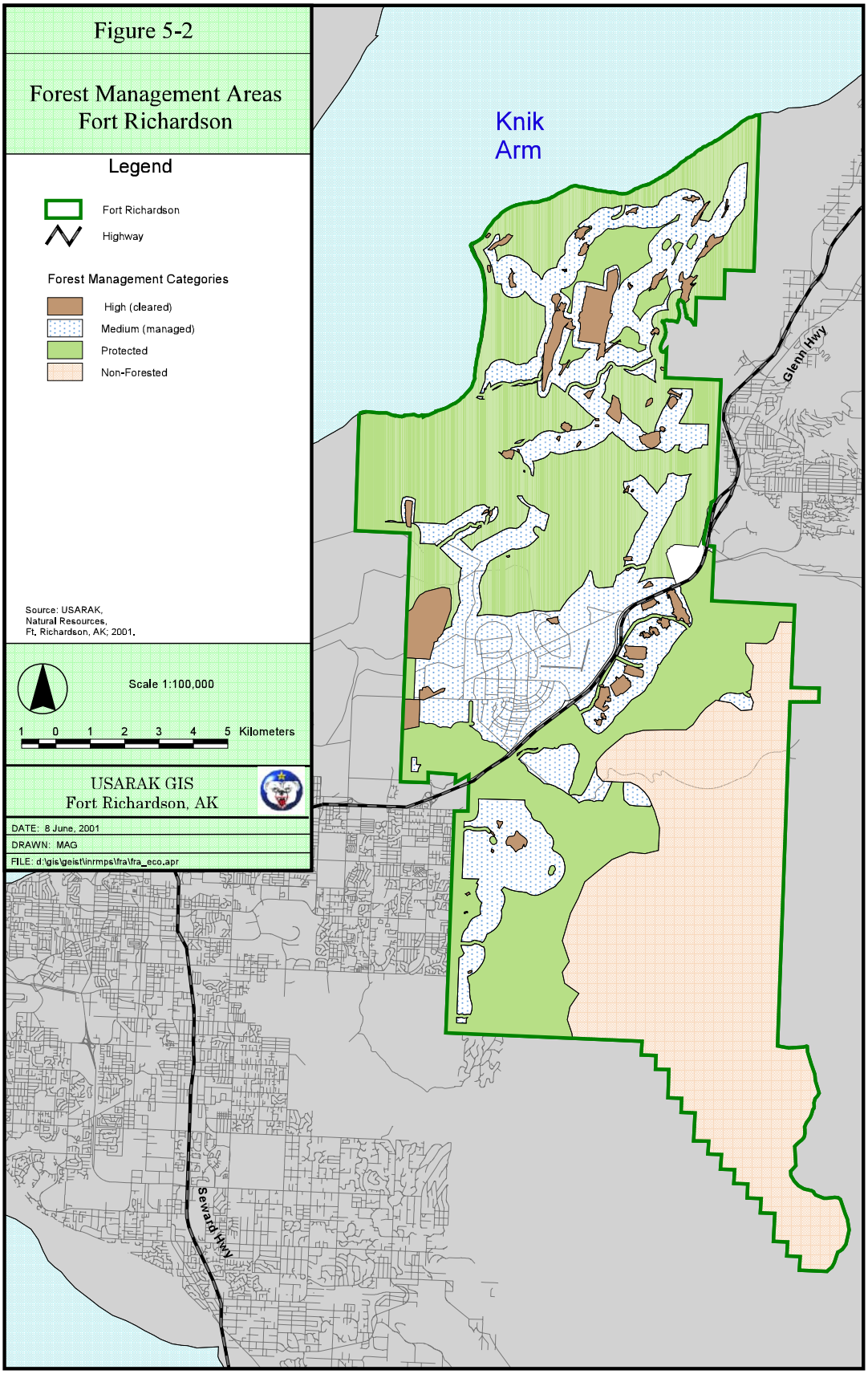
Forest Management Areas: Forest management areas are those areas where forest management actions may occur during 2002-2006. These management areas are described in Table 5-9 and are depicted in Figure 5-2.

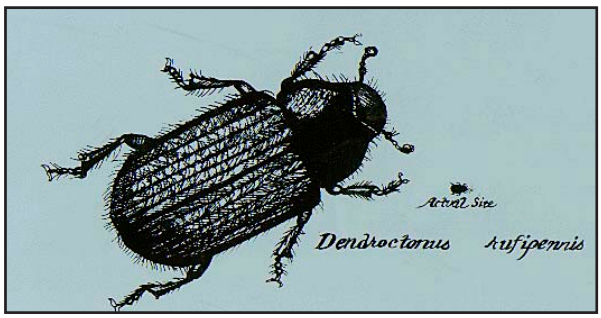
Management History: There have been no commercial forest sales on Fort Richardson because of a limited market. Also most of the forest is relatively young due to widespread forest fires in the early

Table 5-9. Forest Management Areas.

Management Areas	Priority	Size
Forest management areas	High priority for forest management	6,500 acres
	Medium priority for forest management	18,000 acres
	Low priority for forest management	24,400 acres
Forest protection areas	No forest management	300 acres
Non-forested areas		12,800 acres

Figure 5-2. Forest Management Areas.





Spruce bark beetle.

1900s (Elmendorf AFB 1994). Valley Sawmill is the closest market for Fort Richardson sawtimber. The market for sawtimber was limited, and the post has little of what is considered high quality. There was also no market for pulpwood, as the lack of bidders for the 1995 timber sale designed to clear land for the Malemute Drop Zone expansion project clearly indicated. This wood was appraised at $30/MBF and $25/cord. No response was obtained during the first attempt to sell the timber even though over 20 potential bidders were contacted.

Fort Richardson's forestry program has emphasized support of the military's mission, enhancement of habitat diversity in the forest ecosystem, protection of forest watersheds, and management of wildlife habitat. It has also promoted outdoor recreation opportunities and produced some personal use forest products.

From 1996-1997, approximately 70 acres of mature forest were cut for expansion of the Malemute Drop Zone (DZ). Free permits were given to the public for personal use of the timber and fuelwood to expedite the clearing. The ultimate goal is to clear approximately 300 acres of mature forest for expansion of the Malemute DZ to a suitable size to accommodate current and future military training operations.

As a result of the recent spruce bark beetle infestation in south-central Alaska, there are many acres (undetermined) where dead or dying white spruce are common on Fort Richardson. A White Spruce Protection Project proposal for the cantonment area on Fort Richardson was funded by the USFS in 1999. A thorough inventory was made of all large surviving white spruce trees in and around the cantonment area. The inventory was followed by treatments for the protection of the remaining trees.

Current Management: Forest management does not just involve commodity production; protection of sensitive habitats and needs of the military for cover and concealment are also primary objectives. It is important to maintain a wide variety of ages and species of trees, protect old growth forests, protect watersheds, and protect options for future management. The components of forest management on Fort Richardson include timber removal for military mission support, timber stand improvement, forest regeneration, timber management, timber sales, and forest disease/insect prevention.

Conduct Timber Removal for Military Mission Support: The military needs to train personnel under certain environmental conditions. This may require the removal of trees to create open areas for drop zones, small arms firing ranges, or construction. Thinning stands of trees to allow maneuverability in certain areas may also be necessary. Plans


Spruce tree dying from beetle attack (note the yellowing).

for removing timber during the April 15 to June 15 time frame must include measures to protect nesting habitat.

USARAK natural resources personnel have two choices when there is a need to clear or thin timber with commercial value on withdrawn lands. They can request support from BLM to conduct a timber sale, or they can remove the trees (by cutting or burning) without selling them, pending approval from BLM and after NEPA analysis. Troops are permitted to harvest some forest products to achieve training objectives. For example, trees less than four inches dbh may be cut without prior approval, but removal of larger trees requires Natural Resources Branch approval. Remaining stumps must be less than six inches high. (U.S. Army, Alaska 1994).

Timber Stand Improvement: Timber Stand Improvement (TSI) is designed to improve species composition, quality, and/or growth rate of existing stands by removing competing vegetation to allow preferred trees to grow at faster rates. TSI is often categorized as activities used to improve the quality of commercial timber, but it may also be used to improve forest conditions for other uses. TSI may include thinning, chemical injection, prescribed burning, etc., all of which are designed to improve species composition, quality, and/or growth rate of existing stands by removing competing vegetation to allow preferred trees to grow faster.

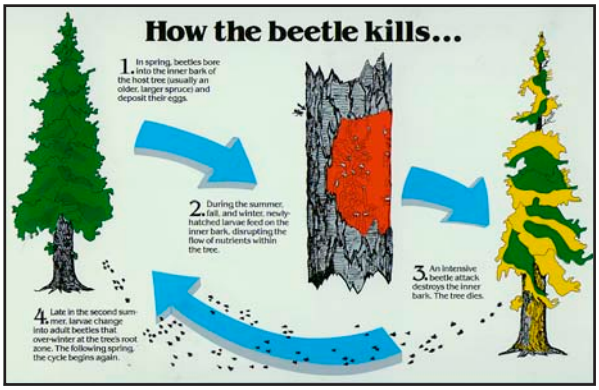
Spruce bark beetle holes.

Forest Regeneration: Regeneration of forests, either natural or planned, is an essential part of forest ecosystem development. Regeneration of forests can be made through planting seedlings, planting sprigs, coppice cuts or seeding.

Timber Management: Timber management involves managing vegetation and timber to meet ecosystem management objectives while maximizing the commercial value of the timber that must be cut to meet those objectives. Management of white spruce should be conducted on a 120-year rotation, and aspen sawtimber should be conducted on a 60-year rotation. Black spruce is not suitable for commercial management. Timber should be harvested using selective harvest (taking out certain diameters on a given cut) and improving species composition at the same time using species-specific harvest. The preferred method is to cut older white spruce first (about 25 trees per acre to a 70%-80% BA) as well as culls and undesirables, leaving aspen, cottonwood, and birch. This resulting mixed forest grows better than white spruce monocultures. Selective cutting also reduces *Calamagrostis* infestation of cut sites.

Timber Sales: The removal and/or thinning of timber on portions of Fort Richardson could improve conditions for conduct of the military mission and enhance the local economy. The Fort Richardson Resource Management Plan (BLM and U.S. Army 1994) requires that timber sales on Fort Richardson be governed by common BLM timber management practices, contract stipulations, and the mandates of the state's forest practices regulations. Common requirements include:

- Construction, improvement, and maintenance of safe and environmentally-sound road systems.



Spruce bark beetle life cycle.

- ➤ Felling and yarding of timber in such a way as to protect soil and water quality, residual trees, and human safety.
- ➤ Treatment of logged sites to prepare them for the next generation of trees.
- ➤ Disposal of logging slash for silvicultural and/or fire hazard reduction purposes.
- ➤ Mitigation measures for protecting wildlife habitat, such as measures to protect nesting habitat from April 15 to June 15.
- ➤ Other miscellaneous provisions, where appropriate, such as meeting minimum fire requirements and application of disease control measures.

Harvest plans would be prepared prior to commercial sales of forest products. Plans would include sale boundaries, cruised volume, silvicultural prescription, road layout, best management practices for prevention of soil erosion and sedimentation, water quality considerations, cultural resources protection, wildlife considerations, harvest method(s), scaling requirements, slash disposal, site preparation, and regeneration requirements. A USARAK wildlife biologist would assist with plans for timber sales to ensure consideration of wildlife habitat values. Documentation for compliance with NEPA as well as required cultural resources surveys would be completed prior to sales.

Forest Disease/Insect Prevention: The primary forest insect problem on Fort Richardson is the spruce bark beetle (*Dendroctonus rufipennis* [Kirby]). This forest pest has been active throughout south-central Alaska for over 25 years and especially in the Anchorage vicinity since the early 1990s.

The spruce bark beetle prefers white spruce trees that are greater than six inches in diameter; black spruce is rarely attacked. Mature forests are most susceptible. Outbreaks generally last four to five years and then collapse. The spruce bark beetle sometimes kills virtually all trees in older, dense stands, which makes natural regeneration of white spruce more difficult due to the resulting lack of seed sources. White spruce only produces good seed crops about once every five years. The spruce bark beetle larvae live between the bark and wood, and when mature, the beetles emerge from infested trees and fly to new trees in mid-May to mid-June. Beetles prefer to fly to downed trees (Holsten et al. undated).

White spruce seed germination requires disturbance of mineral soils. Under natural conditions these disturbances are associated with glaciation, fire, flooding, etc., but human activities, particularly fire suppression, have reduced these regimes. The spruce beetle outbreak in south-central Alaska is symptomatic of stagnating forest ecosystems. The combination of mature spruce and a reduction in natural disturbance is ideal for the spruce bark beetle (Dr. Edward Holsten, pers. com. 1995).

Spruce bark beetle infestations may result in invasions by species such as bluejoint grass, a native perennial, invasive species. When a closed spruce canopy is reduced by 40 percent or more, conditions are good for bluejoint grass invasion. This is especially true if there is inadequate scarification to promote good seedbeds. Logging during winter often fosters prime conditions for bluejoint grass due to little soil disruption of frozen grounds (Dr. Edward Holsten, pers. com. 1995).

Major insect outbreaks may cause changes in habitat for many wildlife species, such as songbirds and raptors. Those species that prefer older, more mature forests will experience a decline in habitat quality while those preferring younger successional stages (or dead timber) will benefit from these changes.

The best prevention tactic to reduce spruce bark beetle damage is to manage for a diversity of spe-

Table 5-10. Forest Management Projects.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct timber management on Fort Richardson North and South Posts.	USARAK Natural Resources	High	x	x	x	x	x
USARAK will remove or thin up to 400 acres of trees or shrubs per year to support military training activities.	USARAK Natural Resources	High	x	x	x	x	x
Conduct timber stand improvement on a maximum of 100 acres per year.	USARAK Natural Resources	High	x	x	x	x	x
Conduct salvage cuts on up to 400 acres per year.	USARAK Natural Resources	High	x	x	x	x	x
Conduct forest pest protection on up to 200 acres per year.	USARAK Natural Resources	High	x	x	x	x	x
Provide fuelwood and Christmas trees to military and public annually.	USARAK Natural Resources	High	x	x	x	x	x
Conduct timber sales and cut up to a maximum of 20,000 board feet per year.	USARAK Natural Resources	High	x	x	x	x	x

cies and age classes within the forest. Thinning of the canopy by a least 40 percent may help by warming the soil and reducing competition; bluejoint grass favors lowered soil temperatures while spruce and birch favor warmer soils (Dr. Edward Holsten, pers. com. 1995).

Several insect defoliators including the mourning cloak butterfly (*Nymphalis antiopa*), spear-marked black moth (*Rheumaptera hastata*), large aspen tortrix (*Choristoneura conflicana*) and the spruce budworm (*Choristoneura* spp.), periodically cause some loss of growth in isolated stands. These outbreaks have been very limited and cause relatively little damage. Large-scale control is neither needed nor feasible.

Some trees are infected with a fungus called heart rot. It is especially prevalent in birch stands over 80 years of age (Elmendorf AFB 1994). Heart rot is best managed by maintaining relatively young stands, but this is incompatible with the noncommercial objectives of forest management on Fort Richardson. The ecological role of older trees with heart rot outweighs the advantages of maintaining younger stands, especially considering the scarcity of older stands on the post. There are no other serious forest pests or diseases known to occur on Fort Richardson.

Proposed Management: Conduct forest management on Fort Richardson as outlined in Table 5-10.

Other Management Alternatives Considered and Eliminated: There are other potential methods for managing forests. No other options, however, would meet the needs of the military mission. The proposed management actions listed above carefully balance the needs of the military mission, recreation, and the ecosystem. Other actions would be too minimal or would be cost prohibitive.

5.2.5 Forestry Responsibilities

BLM retains vegetation rights for all withdrawn lands on Fort Richardson except for several small parcels. Any vegetation manipulation by USARAK on lands where BLM retains vegetation rights must be approved by BLM. BLM timber management practices, contract stipulations, and the mandates of the state's forest practices regulations would govern the sale of timber from such areas.

Forestry management will be completed in cooperation with BLM, which holds timber rights for most Fort Richardson lands. Forests on withdrawn lands fall under BLM's restricted category for management; that is, management of the area is primarily for military use, but timber harvests are permitted. Members of the public may approach BLM for a

permit to purchase timber on withdrawn lands, but each timber sale must be approved by the military.

Any timber removal and other forest management practices will be coordinated with Range Control to ensure minimal disruption of military training. Scheduling usually will be done three to six months in advance of activities. Appropriate NEPA documentation will be completed prior to implementation of timber stand improvement projects.

5.3 Fire Management

Wildfires are a concern at Fort Richardson, but rarely are they a significant problem. Severe drought conditions only occur about once every 20 years. In normal years, there is an average of less than five wildfires that are usually mission-related, small, and easily contained.

The Chugach Mountain slopes behind the Small Range Complex have a high potential for wildfires. Most fires started there are from tracer rounds and pyrotechnics fired from adjacent ranges when fire danger is high. Fires in this area can affect the already poor air quality of Anchorage and, if they escape, could burn north toward the community of Eagle River, southwest into Anchorage, or east into Chugach State Park. In addition, the recent spruce bark beetle outbreak, which has killed many of the mature white spruce trees in the area, has led to public perception that there is an increased potential for wildfires due to excessive fuel loading.

USARAK is aware of this situation and is currently working with BLM fire management personnel to develop more protective measures that will reduce the existing threat of wildfires and will also allow increased use of the firing ranges for training purposes.

5.3.1 Fire Management Goals

Fire management goals all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. The fire management goals for Fort Richardson are:

- Protect human structures and military training sites, but not the land, from fire.
- Use prescribed burning to manage natural resources and reduce losses from catastrophic wildfire.

5.3.2 Fire Management Plan

Fire program management and planning includes all the planning, budgeting, contract oversight, and organization necessary to implement the fire management program. The primary emphasis for this component of the fire management program is the preparation and update of the fire management plan every five years.

Description and Justification: Write, update, and implement a fire management action plan for Fort Richardson. The fire management action plan provides the planning framework for all fire management decision-making, and specifies the uses of fire, which are consistent with and can enhance land management objectives. The plan would reduce forest fire hazard caused by incendiary-type weapons and will enhance habitat as part of ecosystem management. Training is essential to the U.S. Army's mission of preparedness and military readiness. Fire management has become an increasing concern on training sites in recent years as the activities associated with training increases the risk of unplanned fire ignitions with the use of ammunition and pyrotechnics. This document provides guidance and direction to establish an effective fire management program and the eventual development of a fire management plan that fulfills interagency guidelines. This document identifies responsibilities and standard practices for fuels management, pre-suppression, prevention, and suppression while supporting military preparedness along with United States Department of the

Table 5-11. Fire Management Action Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Prepare annual updates of the fire management action plan.	USARAK Natural Resources	High	x	x	x	x	x
Prepare and update fire management action plan for the planning period of 2007-2011.	USARAK Natural Resources	High					x
Complete NEPA documentation for update.	USARAK Natural Resources	High					x
Develop an Interagency Fire Management Plan that adheres to guidelines outlined by the Interagency Wildland Fire Coordinating Group.	BLM Alaska Fire Service	High		x			
Develop pre-suppression plans for each of the area units of Fort Richardson: Cantonment Area, North Post and South Post.	BLM Alaska Fire Service	Medium		x			
Develop plans for proposed prescribed burns on Fort Richardson.	BLM Alaska Fire Service	Medium		x			
Develop plans and fuel treatment projects to reduce the threat of fires starting on military lands and impact areas and burning onto adjacent lands of high resource value.	BLM Alaska Fire Service	Medium		x			
Develop generic burn plan for various military directorates to use for grounds maintenance projects.	BLM Alaska Fire Service	Medium		x			

Interior, Bureau of Land Management (BLM) and United States Army Alaska (USARAK) resource management goals. Updates of the fire management action plan are required by the Memorandum of Understanding between BLM and USARAK concerning the Management of Certain Public Lands Withdrawn for Military Use and the Interdepartmental Support Agreements WC1SH3-95089-502 and 140138-95089-905 between USARAK and BLM and Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- ➤ Complete, update, and maintain a fire management action plan.
- ➤ Establish fire management procedures and protocols to provide USARAK the capability to complete its mission to maintain combat readiness and fulfill resource management intent.
- ➤ Maintain and enhance the health, productivity and biological diversity of the ecosystem through fire suppression, fire prevention, and prescribed fire planning.
- ➤ Involve resource agencies in the planning process for fire management and the public in review of the plan.

Management History: The first fire management action plan was completed in 2001.

Current Management: Current management actions to update the fire management action plan will cease in 2002. If this INRMP is not approved and funded, no new fire management action plan will be prepared, updated, or implemented. Policies already in place in the current fire management action plan will continue.

Proposed Management: Prepare and update the fire management action plan for Fort Richardson as outlined in Table 5-11.

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current fire management action plan with up-

dates at least every five years. NEPA documentation is also legally mandated.

5.3.3 Fire and Fuels Inventory

Description and Justification: Fire and fuels inventory includes the inventory of forest fuel hazards, the delineation of areas in need of fire suppression, as well as the mapping of past fires. This information is useful for managing and decision-making during fire events. Past fire history also is an important input into habitat management decision-making. Conducting fire and fuels inventory is required by Public Law 86-797 (Sikes Act) to implement the INRMP.

Measures of Effectiveness:

- ➤ Maintain a complete history of fires on Fort Richardson.
- ➤ Identify and quantify potential forest fuel hazards on Fort Richardson.
- ➤ Map all areas that contain features needing fire suppression.

Management Areas: Fire history on Fort Richardson is shown in Figure 5-3.

Management History: In 1999, a fire fuel hazard map was created for Fort Richardson. Fire surveillance activities have been ongoing since Fort Richardson was created in the 1950s.

Current Management: Fire surveillance activities remain an integral part of range operations and the fire department.

Proposed Management: Continue the fire and fuels inventory program as outlined in Table 5-12.

Other Management Alternatives Considered and Eliminated: There are other potential methods of conducting a fire and fuels inventory. The proposed methods for conducting the fire and fuels inventory, however, were developed specifically for boreal forest areas in Alaska.

5.3.4 Fire Management

Description and Justification: The components of fire management include both prevention and suppression. Benefits of fire suppression and fire prevention to military training include reduced fuel load, an increased number of days that a facility is available during high fire season, reduced fire fighting costs, and protection of range facilities. Benefits to the environment are considerable, particularly in areas that have not burned in recent years. Fire management is required to protect, maintain, and enhance military training environments. In addition, management of the boreal forest ecosystem is important to maintain biodiversity, wildlife habitat, and the development of outdoor recreation. The management of fire on the landscape is consistent with ecosystem management principles. Conducting fire management is required by Public Law 106-65 (Military Land Withdrawal Act) as mitigation for the land withdrawal LEIS, and by Public Law 86-797 (Sikes Act) to implement the INRMP.

Measures of Effectiveness:

- ➤ Protect structures and man-made facilities.
- ➤ Reduce the ability of potential fires to spread outside Fort Richardson.
- ➤ Reduce forest fuel hazard through prescribed burning.
- ➤ Reduce the escapement of wildland fire from impact areas through prescribed fires and mechanical treatments along the boundaries of impact areas.

Management Areas: Fire suppression priorities are grouped into four categories: critical, full, modified, and limited. Summaries of each category (from Anonymous 1982) are presented below. Fire protection categories for North and South Post on Fort Richardson are full. Fire management categories by area on Fort Richardson are shown in Figure 5-4.

Critical Management Option: Areas receive maximum detection coverage and are highest priorities for attack response. Immediate and aggressive initial attack is provided. Land owners/managers are notified of the situation as soon as possible. Critical management areas receive priority over adjacent lands and resources in the event of escaped fires.

Full Management Option: Areas receive maximum detection coverage and receive immediate and aggressive initial attack responses. If the initial attack response is successful or the fire is otherwise

Table 5-12. Fire and Fuels Inventory.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Collect fuel loading information as part of the forest inventory.	USARAK ITAM	Medium	x	x	x	x	x
Delineate and maintain GIS data layers showing historical fires on Fort Richardson.	USARAK ITAM	Medium	x	x	x	x	x
Map past areas where ordnance has been used and develop pre-suppression plans on how to deal with wildland fire suppression in these areas.	USARAK ITAM	Medium	x	x	x	x	x
Map all known cultural features on suppression maps and develop fire management recommendations for these features.	USARAK ITAM	Medium		x			
Map all military structures on suppression maps. Assess fire suppression options and recommendations for these structures.	USARAK ITAM	Medium		x			
Map all known natural resource features, areas of concern, and management activities on suppression maps. Develop management strategies to avoid conflicts with these natural resource features and areas of concern.	USARAK ITAM	Medium			x		
Update fuels map of Fort Richardson.	USARAK ITAM	Medium			x		
Update fire history map of Fort Richardson.	USARAK ITAM	Medium	x	x	x	x	x
Research causes of fire ignitions on Fort Richardson to identify areas of high fire occurrence.	USARAK ITAM	Medium				x	
Map all known non-sensitive structures on Fort Richardson.	USARAK ITAM	Medium				x	
Update fire maps with military special use areas and fire management options for these areas.	USARAK ITAM	Medium	x				
Research weather patterns influencing fire behavior and historical weather analysis for each land unit of Fort Richardson.	USARAK ITAM	Medium	x				

controlled within the first burning period, special agency notification is not required. When fires escape initial attack and require additional suppression, affected land owners/managers are notified to develop further fire strategy.

Modified Management Option: This option provides a management level between full and limited. The intent is to provide a relatively high degree of protection during periods of increased fire danger, but a lower level of protection when risks of fires are diminished. Modified areas receive maximum detection coverage. Initial attack action, or non-action, is based on a standardized evaluation date determined by the Alaska Interagency Wildland Fire Coordination Group. Unmanned fires are monitored.

Limited Management Option: This option recognizes areas where natural fire is important or the values at risk do not warrant the expense of suppression. Limited management areas receive routine detection effort. Attack response is based on the need to keep the fire within limited management areas and to protect individual critical management sites within limited management areas. Land owners/managers are immediately notified of fires detected. Unmanned fires are monitored.

Figure 5-3. Fort Richardson Fire History.

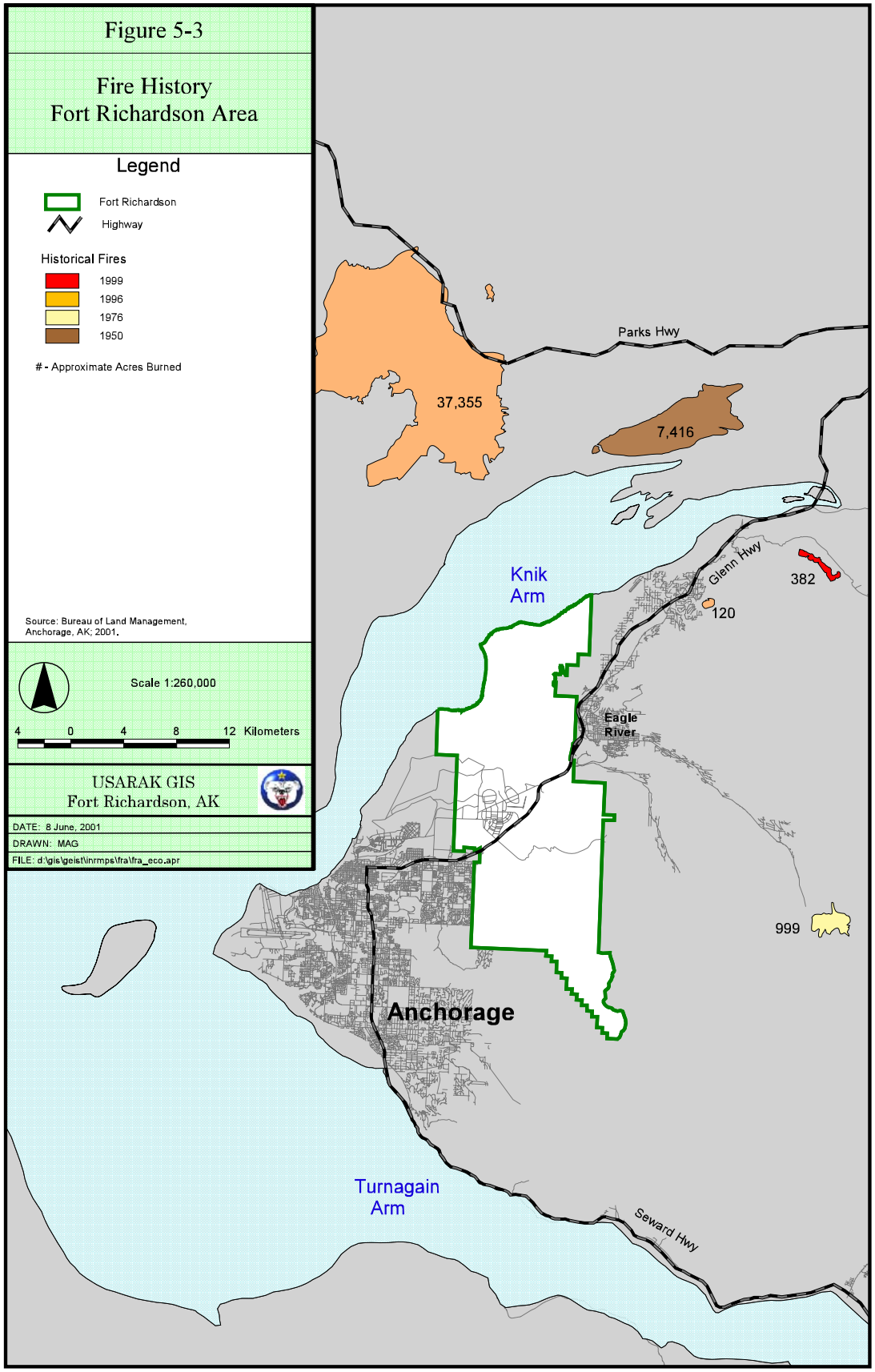
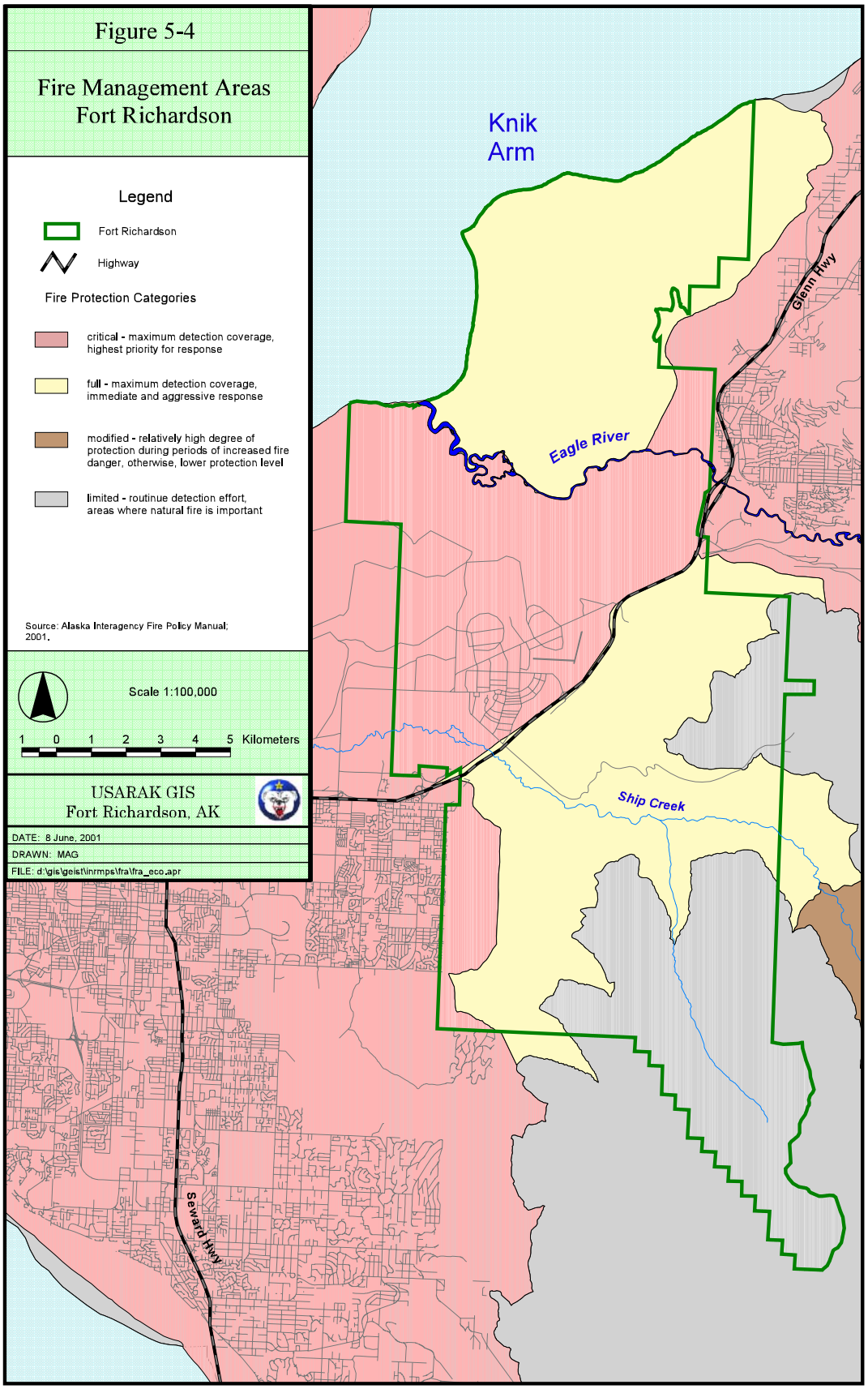


Figure 5-4. Fire Management Areas.



There are two other special categories on Army lands in Alaska. *Unplanned* areas are those lands that the land manager/owner has opted out of the Alaska Interagency Wildland Fire Management Plan. These lands are usually treated as full. For suppression direction the land manager needs to be contacted. *Restricted* or *hot zone* is a category used for impact areas and other places where no on-the-ground fire fighting occurs. Fires can still be suppressed in restricted areas, but suppression is through back burning or aerial-dropped retardant.

Management History: Fire suppression has traditionally been confined to areas behind the small arms complex. Because of the extensive mortality of white spruce in the area, fire prevention activities were conducted in 1999 and 2000 to reduce fire fuels immediately behind the small arms ranges.

Current Management:

Determining Fire Danger: The Fire Danger Rating (FDR) is used on Fort Richardson to reduce the risk of wildfire. The Fort Richardson Fire Department monitors fire danger parameters; when certain levels of risk are reached, restrictions on military activities are imposed. The fire department collects weather readings during fire season. Data are used to calculate the FDR using the Canadian Forest Fire Danger Rating System, which is an indication of wildfire danger. The FDR is provided to Range Control, which restricts the use of munitions and pyrotechnics as fire danger increases. Open burning requires a permit, except for small warming fires (Army Environmental Handbook 2000). All fires may be prohibited during extreme fire danger conditions.

The 1998 USARAK Range Policy categorizes fire danger into four broad headings: low, moderate, high and extreme. When equating the Canadian Forest Fire Danger Rating System (CFFDRS) fire categories with the categories in this broad rating scheme there will always be a certain amount of subjectivity involved, as no single (USARAK) category gives a complete picture of the fire danger. A thorough understanding of CFFDRS is necessary for the fire manager to make accurate determinations.

Wildfire Prevention: There are three components of wildfire prevention on Fort Richardson. The first component is to reduce the likelihood of starting a fire by limiting activities as imposed by the fire danger rating system. Reducing fuel hazard through mechanical removal and prescribed burning is the second component, and constructing or maintaining fire or fuel wood breaks is the third component.

Both prescribed burning and mechanical removal of vegetation can be used to accomplish fuel hazard reduction, which, in turn, makes wildfires less likely to start and easier to control. Burning often opens areas to additional military training options, particularly maneuvers that are hampered by dense cover.

The prescribed burning "window" is very narrow, particularly during spring between loss of snow cover and green-up, usually occurring in May. Often this period is very wet, which makes burning difficult. It is often easier to get good burning conditions in fall, but there is debate over the relative value of fall burning. In addition, winds must be such that they do not blow smoke into urban areas, which further narrows the window. It is difficult to plan prescribed burning due to weather, military training, and availability of resources. An air permit from the Alaska Department of Environmental Conservation is required for any burning, as well as NEPA documentation.

Individual prescribed burns will have plans and appropriate NEPA documentation prepared after coordination between the BLM/NFO, the Natural Resources Branch, and the Fort Richardson Fire Department. AFS may be used to prepare plans for USARAK. Burn plans are used to evaluate and minimize risks associated with prescribed burning and will include how the fire will be set.

Cutting lanes specifically for fire control occurs only minimally at Fort Richardson. Major highways, waterways, wet areas, and smaller roads act as firebreaks on much of the installation. The likelihood of a fire crossing these obstructions is not cost effective enough to create and maintain firebreaks.

Wildfire Suppression: Wildfire suppression is an emergency operation and takes precedence over

all other operations with exception of safeguarding human life. Initial attack operations for fires started on all critical, full, and modified (before conversion to limited) lands is provided by the USARAK Fire Department. Wildfire suppression is accomplished by the BLM Alaska Fire Service through the Alaska DNR Division of Forestry. USARAK contributes to fire detection and is available to help as needed. Fire suppression priorities are grouped into four categories: critical, full, modified, and limited, as described above.

Prescribed Burning: Prescribed burning is a method of replacing ecosystem functions without the danger and loss of an uncontrolled wildfire. Wildfires probably had a more important influence on ecosystem functions during presettlement times. Even then, except during drought periods, fires were still relatively small and localized due to the weather and climate in the Anchorage area. With settlement came fire suppression and road systems (firebreaks) that further reduced natural fire frequency at Fort Richardson. Today, the absence of wildfires may be inhibiting the potential for optimal ecosystem development. The current infestation of spruce bark beetles in old-aged timber is one problem that may have been exacerbated by a lack of wildfires.

Proposed Management: Conduct fire management on Fort Richardson as outlined in Table 5-13.

Other Management Alternatives Considered and Eliminated: There are other potential methods for conducting fire management. No other options, however, would meet the needs of the military mission. The proposed management actions listed above carefully balance the needs of the military mission, recreation, and the ecosystem. Other actions would be too minimal or would be cost prohibitive.

5.3.5 Fire Management Responsibilities

The Fort Richardson Fire Department maintains the responsibility for first response for wildfire suppression. Due to the small size of most fires, this response is generally adequate. The Fort Richardson Fire Department monitors fire danger parameters. When certain levels of risk are reached, restrictions on military activities are imposed. The fire department collects weather readings during fire season. Data are used to calculate Fine Fuel Moisture Content (FFMC), which is an indication of wildfire danger. The FFMC is provided to Range Control, which restricts types of munitions and pyrotechnics allowed as fire danger increases.

The BLM reimburses the Alaska Division of Forestry (DOF) for wildfire suppression in the southern half of the state. Such support has been requested only twice in the past four years.

The DOF also provides training for wildfire suppression to Fort Richardson personnel. There is a mutual aid agreement with regard to fire suppression between USARAK and Elmendorf AFB (Elmendorf AFB 1994).

5.4 Fish and Wildlife Management

Fish and wildlife management on Fort Richardson has a history of traditional game management to support hunting, trapping, and fishing. In the early 1980s this base broadened, driven by a growing recognition of the importance of nongame species in ecosystem functions. In the mid-1990s, broad-scale fauna and flora inventories were initiated with the goal of implementing a more ecosystem-based approach to natural resources management. These

Wildlife watching.

Table 5-13. Fire Management Projects.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Conduct fire suppression activities as necessary.	BLM Alaska Fire Service (ADNR – Division of Forestry)	High	x	x	x	x	x
Identify and assess fuel management strategies for urban/wildland interface areas.	USARAK Natural Resources	High	x	x	x	x	x
Implement Firewise Program for private landowners adjacent to military lands.	USARAK Natural Resources	High	x	x	x	x	x
Break up large continuous fuels in areas requiring fire suppression status.	USARAK Natural Resources	High	x	x	x	x	x
Develop more effective means of calculating fire weather indices for localized training areas and implement a program for relaying fire danger ratings to training units.	USARAK Natural Resources	High	x	x	x	x	x
Develop a program to provide assistance to military units during periods of high fire danger.	USARAK Natural Resources	High	x	x	x	x	x
Develop and disseminate procedures for detecting and reporting fires.	USARAK Natural Resources	High	x	x	x	x	x
Develop standard operation procedures for each training site on Fort Richardson to assist firefighters and incident commanders in establishing priorities, making decisions, dealing with ordnance issues, etc.	USARAK Natural Resources	High	x	x	x	x	x
Develop GIS system for military fire management office and for use on incidents with current data, maps, photos, suppression options, and restrictions.	USARAK Natural Resources	High	x	x	x	x	x
Identify and use fuel reduction treatments to reduce the threat of wildland fire at the urban/wildland interface, military structures, selected training areas, and cultural resources.	USARAK Natural Resources	High	x	x	x	x	x

inventories will continue, and formal long-term monitoring programs will also be initiated as the ecosystem approach to management expands. The natural resources staff at Fort Richardson looks forward to the challenge of developing and implementing a landscape-scale ecosystem management program while at the same time maintaining high quality game habitat on Fort Richardson and, of course, continuing to promote the use of the land for military training.

5.4.1 Fish and Wildlife Management Goals

Fish and wildlife management goals all contribute to one or more of the overall natural resources program goals of stewardship, military training support, compliance, quality of life, and integration. The fish and wildlife management goals for Fort Richardson are:

- Improve the quality of habitat for game and nongame species.
- Monitor selected mammal and bird populations for long-term trends.
- Use artificial nesting structures to improve productivity for wildlife species.
- Produce game on a sustainable basis to support hunting and fishing programs.

5.4.2 Habitat Management Plan

Fish and wildlife program management and planning includes all the planning, budgeting, contract

oversight, and organization necessary to implement the fish and wildlife management program. The primary emphasis for this component of the fish and wildlife management program is to prepare and update the habitat management action plan.

Description and Justification: Prepare, update, and implement a habitat management action plan for Fort Richardson. The plan will describe projects to improve habitat for moose, upland game birds, some furbearers and small mammals, some migrant landbirds, and soldiers. The habitat management plan will maintain habitat for several game species, maintain a diverse training environment, enhance recreational opportunities, and comply with the Sikes Act, Migratory Bird Treaty Act, Executive Order 12962, Recreational Fishery Resources Conservation Plan, Endangered Species Act, and AR 200-3. Updates of the habitat management plan are required by Public Law 86-797 (Sikes Act) every five years to implement the INRMP. Per Memorandum DAIM-ED-N, 21 March 1997, this component of the INRMP is a class 1 requirement.

Measures of Effectiveness:

- ➤ Complete, update, and maintain a habitat management action plan.
- ➤ Enhance wildlife, recreation, and military habitat on Fort Richardson.
- ➤ Involve the resource agencies in the planning process for habitat enhancement and the public in review of the plan.

Management History: The first habitat management action plan for Fort Richardson was completed in 2001.

Current Management: Current management actions to update the habitat management plan will cease in 2002. If this INRMP is not approved and funded, no new habitat management plan will be prepared, updated, or implemented. Policies already in place in the current habitat management plan will continue.

Proposed Management: Prepare and update the habitat management action plan for Fort Richardson as outlined in Table 5-14.

Other Management Alternatives Considered and Eliminated: There are no alternatives to maintaining a current habitat management action plan in terms of updates at least every five years. NEPA documentation is also legally mandated.

5.4.3 Fish and Wildlife Inventory and Monitoring

5.4.3.1 Fish and Wildlife Monitoring

Fish and wildlife monitoring involves the continuation of existing programs and the creation of new long-term monitoring programs for birds, fish, and small mammals on Fort Richardson. These surveys focus on neotropical migratory birds, waterbirds, raptors, salmon, trout, and other fish species, frogs, small mammals, furbearers, and large mammal species. These monitoring programs are a major component of the ecosystem management program (see Chapter 3). Raptors are important predators in the ecosystem and many are vulnerable to human impacts. Fish are important in the ecosystem as both predators and prey, and are also important to scavengers, decomposers, and as a source of nutrients in freshwater systems. Small mammals play important ecological roles as secondary consumers

Table 5-14. Habitat Management Action Plan.

OBJECTIVE	RESPONSIBLE FOR IMPLEMENTATION	PRIORITY	IMPLEMENTATION				
			2002	2003	2004	2005	2006
Prepare annual updates of the habitat management action plan.	USARAK Natural Resources	High	x	x	x	x	x
Prepare and update habitat management action plan for the planning period of 2007-2011.	USARAK Natural Resources	High					x
Complete NEPA documentation for update.	USARAK Natural Resources	High					x

and as prey for a variety of predators. There is considerable concern in North America over declining populations of many neotropical migratory birds, and population trend data are required to manage and protect these declining species, as mandated by the Sikes Act and AR 200-3.

Description and Justification: Fish and wildlife monitoring on Fort Richardson entails monitoring ecologically important and sensitive species including fish, frogs, moose, bears, Dall's sheep, furbearers, small mammals, raptors, waterbirds, and neotropical migratory birds. Game and furbearer monitoring will emphasize moose, ruffed grouse, black and brown bears, lynx, and snowshoe hare. Moose are monitored to ensure harvest levels are optimal for both utilization and protection of the species. Ruffed grouse are monitored to determine habitat improvement needs and to monitor the success of habitat improvement practices. Monitoring data will be digitally stored in the USARAK GIS. Conducting fish and wildlife monitoring is required by Public Law 86-797 (Sikes Act) to implement the INRMP.

Measures of Effectiveness:

- ➤ Complete annual or bi-annual monitoring of fish and wildlife to support decision-making and management of the ecosystem at Fort Richardson.
- ➤ Continue existing monitoring programs to evaluate population trends.
- ➤ Initiate long-term monitoring programs for selected species not currently monitored.

The wood frog is the only amphibian known to occur on Fort Richardson.

- ➤ Conduct cost-sharing of monitoring, utilizing partnerships with ADF&G, USFWS, and BLM.

Management History:

Frogs: Amphibian population declines and reports of amphibian deformities worldwide over the past decade have raised concerns over the status of the wood frog (*Rana sylvatica*) in Alaska. To date, little work has been done to determine the current wood frog population in the south-central region. An Alaska Pacific University graduate student and the Alaska Natural Heritage Program (AKNHP) have initiated a volunteer-based amphibian monitoring study to determine where the frogs live, their baseline populations, and the timeline for their breeding season. The USFWS has proposed a more in-depth mark/recapture study to be performed on Fort Richardson if funding and personnel become available.

Small Mammals: A small mammal survey was conducted in summer 1994. Protocols for this survey were established in the LCTA Manual. The survey was not intensive enough to include all important habitats, but did result in a *Checklist of the Mammals of Fort Richardson, Alaska* prepared by Cook and Seaton (1995).

Six species of bats are known to occur in Alaska, however, they are not found in abundance and are primarily limited to the southeast. The little brown bat (*Myotis lucifugus*), the most common and wide ranging bat in the state, is found on Fort Richardson. It prefers to roost in small colonies in abandoned buildings, mine tunnels, and caves, or may be found near a permanent source of water. Use of pesticides, disturbance and/or destruction of roosts, and loss of foraging habitat have resulted in a drastic decline of little brown bats in many areas. Nationwide, over half of all bat species are in trouble. Bats generally produce only one offspring per year, so recovery can be a lengthy process. Little is known about the little brown bat on Fort Richardson. University of Alaska, Anchorage graduate students have expressed an interest in conducting studies on Fort Richardson to determine current bat population and distribution, monitor population trends, identify day and night roosts, and map

Ravens are found throughout Fort Richardson, especially in winter.

migration routes. Sources for funding these studies are being sought.

Furbearers: During 1995-1996, ADF&G conducted a furbearer study on Fort Richardson with an emphasis on coyotes and the relationships between predatory furbearers and snowshoe hares. In addition, they are currently involved in an ongoing black bear study with Elmendorf AFB and Fort Richardson. These studies are described in Sinnott (1995).

Harvest information on furbearers has been collected from Fort Richardson hunters through a system requiring either sign out at the main gate or a mail-in of harvest data by the end of each year. At the time of sign-out, harvest information is recorded. Fish harvest is monitored through an ADF&G statewide harvest survey. Furbearer harvest data is not very useful due to the mail-in provision, which is often ignored or inaccurate. Beginning in 1998, hunters are required to physically return their checkout sheet to the main gate with harvest data recorded at the end of each hunting day.

Waterbirds: The ERF contamination issue resulted in a great increase in survey efforts, particularly for waterfowl, shorebirds, bald eagles and other avian species associated with ERF. Surveys of this important area on Fort Richardson will continue during 2002-2006, as required for monitoring and remediation efforts on ERF. Results will be recorded in memoranda and electronic databases.

In recent years, at least three other ground and aerial surveys for birds have been conducted beyond those described above. These surveys focused on lakes and wetlands to document waterfowl (especially breeding pairs), shorebirds, ravens, raptors, and other species. These surveys will be continued through 2003.

The USFWS conducted the first systematic waterfowl surveys on Fort Richardson in 1996 and 1997 as part of a Legacy project. Lakes and ponds were surveyed for the presence of loons, grebes and other waterfowl during the spring migration. Results of this survey will be used to determine additional monitoring needs for water birds.

Raptors: A 1994 USFWS raptor inventory on Fort Richardson (Schempf 1995) identified six different types of raptors: bald eagle, golden eagle, northern harrier, red-tailed hawk, Harlan's hawk (dark phase of red-tailed hawk), and sharp-shinned hawk. Although no goshawks were found during this inventory, they are known to inhabit the forested areas of the post. The 1998 vegetation map will be used to pinpoint likely habitat for goshawks, and intensive ground surveys will be conducted in those locations.

The USFWS conducted the first intensive owl surveys on Fort Richardson in 1997 (Browne and Andres 1998). Three species of owls were identified: great-horned, saw-whet and boreal. The boreal owl was the most common species with nine birds recorded. Seven great-horned and six saw-whet owls also were recorded.

Landbirds: USARAK used three techniques to monitor neotropical migrant and resident landbirds: LCTA plots, BBS, and MAPS. The survey descriptions have been taken from Roush and Andres (1994) and Andres (1995). Surveys were conducted by the USFWS, CEMML, and volunteers.

The standard of using 60 LCTA plots for breeding bird surveys was modified to 40 plots for use at Fort Richardson. In 1994, 20 of these plots were surveyed. In 1995, 35 plots were surveyed, and in 1996 and 1997, 39 plots were surveyed. All surveys were conducted by USFWS personnel with the bulk of the work being conducted in the month of June.